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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/782,928	02/23/2004	Shin-ichi Uehara	Q79936	7682

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SUGHRUE MION, PLLC
2100 PENNSYLVANIA AVENUE, N.W.
SUITE 800
WASHINGTON, DC 20037

EXAMINER	
CHANG, AUDREY Y	

ART UNIT	PAPER NUMBER
2872	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/782,928	UEHARA ET AL.	
	Examiner	Art Unit	
	Audrey Y. Chang	2872	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 June 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-5,11-15 and 25-28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5,11-15 and 25-28* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *12/27/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on June 7, 2007 has been entered.

2. This Office Action is also in response to applicant's amendment filed on June 7, 2007 which has been entered into the file.

3. By this amendment, the applicant has amended claims 1, 2, 14 and 15, has canceled claims 6-10 and 16-24, and has newly added claims 25-28.

4. Claims 1-5, 11-15 and 25-28 remain pending in this application.

Drawings

5. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the symbols "X", "Y" and "tan(1')" recited in various claims (claims 25-28) must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief

description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

The applicant is respectfully reminded that the drawing objections have been recited in the previous Office Action. In response to applicant's arguments, which states that Figure 4 has shown, the claimed "D", "X" and "Y", the examiner respectfully disagrees since there is none such thing being illustrated in Figure 4.

Claim Objections

6. **Claims 1-5, 11-15, and 25-28 are objected to because of the following informalities:**

(1). **Claims 1 and 14 have been amended** to include the phrase "*a definition of the three-dimensional image in the horizontal direction is less than the resolution by the eyesight of a viewer whose midpoint between the right eye and the left eye is positioned in the three-dimensional visible range*". This phrase is confusing since it is not clear what is considered to be the definition of the "three-dimensional image". The three-dimensional image is an **OPTICAL ILLUSION** that happens in the brain of the observer. It is therefore not clear what is considered to be the "definition" of the three-dimensional image. Furthermore, the definition recited in the specification is referred to the definition of the pixel not the three-dimensional image. The phrase is therefore confusing and can be only viewed broadly as "*the three-dimensional image can be observed by the observer in the three-dimensional image visible range*".

(2). The equations recited in claims 25-28 are confusing and indefinite since the claims fail to provide the physical meaning for "tan(1')" that makes the equation indefinite and arbitrary. The meaning

of this expression must be *explicitly* stated in the claims to make the scopes of the claims clear. At this juncture this expression is open for interpretation as one sees fit.

(3) The phrase "a definition X (dpi)" and the phrase "a definition Y(dpi)" recited in claims 25-28 are confusing and indefinite since it is not clear what is considered to be the "definition" of the pixels. Is this referred to be pixel size? If so please specified.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 1, 3, 11-13, 14, and newly added claims 25 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Ichinose et al (PN. 4,987,487).

Ichinose et al teaches a stereoscopic or three-dimensional image display device that is comprised of a *display panel* (51, Figures 8-9 or 100 Figures 10-11) wherein a plurality of pixels sections including pixels displaying an image for right eyes and pixels displaying an image for left eye arranged in matrix form and periodically arranged in horizontal direction, (51-a1, 51-b1 etc. in Figures 8-9 or LLRR in Figures 10-11). The image display device further comprises a lenticular lens, serves as the optical unit that directs light emitted from the pixels displaying said image. It is implicitly true that a three-dimensional or stereoscopic visible region is inherently defined by placing the midpoint between a viewer's right and left eyes in the visible range such that the image light emitted from the pixels for displaying the right image will incident to the right eye of the observer and the image light emitted from the pixels for display the left image will incident to the left eye of the observer. **Ichinose** et al teaches

that the normal distance between the midpoint of the *eyes* to the *lenticular lens* or the optical unit is D and the distance between the *display panel* and the optical unit is f' (i.e. the focal length of the lenticular length). The actual distance between the midpoint of the eyes and the display panel therefore equals D"= D+ f'. It is also implicitly true that there is a **most** distant point with distance D' between the midpoint of the eyes and the display panel within the three-dimensional visible region for allowing the stereoscopic image to be viewable by the observer.

As demonstrated by Figure 8, the *smallest* separation between two adjacent image pixel sections that can be *resolved* by the eyes so that one image from the first pixel section to be directed to left eye and the other image from the adjacent second pixel section to the right eye is indicated in Figure 8 as *L*. **And the definition of the pixel section is defined as 1/*L*.** From simple geometry one can calculate the definition of the pixel section as the following:

Assuming the *angular separation* between the image lights from the two adjacent pixel sections is *a* and the angular separation of the image light after passing through the optical unit or lenticular lens is *b*. Then the following condition can be established:

L/f'= tan (*a*) and e/D= tan (*b*). "e" being the separation distance between two eyes and D is the observation distance.

The actual distance between the midpoint of the two eyes and the display panel (D") and the actual distance between the **most** distant point in the three dimensional visible range and the display panel (D') are defined as follows:

D"= D + f ' and D'> D".

One can then get the following conditions:

L+ e = (f' * tan (*a*)) + (D * tan (*b*)), for paraxial light, *b*=*a*, and tan (*a*) approximately equals to *a* in radians and tan (*b*) approximately equals to *b* in radians. And if the optical unit is a *parallax barrier* with slits instead of the lenticular lens, the angle *a* will be equal to angle *b*. This means the following:

(L+ e) approximately equals (f' +D)* tan (*a*), which then equals to D"* tan (*a*). This means *L* < D" *tan (*a*), or 1/*L*> 1/(D"* tan (*a*)), with the conversion factor between millimeter to inch (i.e. 25.4 millimeter per inch), **1/*L* > 25.4/(D"* tan (*a*)) (dpi).** Similarly *L* < D'* tan (*a*), (i.e. distance measured from display panel to the **most** distant point in the visible range), and **1/L>25.4/(D'*tan(a))(dpi).**

This means **1/*L*> 25.4/(DIS* tan (*a*)) (dpi).** By setting the distance in the normal direction of the observer to the display panel to be **DIS, wherein DIS is between D' and D" or is the most distance D' .** The **definition** of the pixel section (1/*L*) therefore is defined with respect to the angular separation of the image light from the adjacent pixel section. This reference however does not teach explicitly to have the definition to satisfy the cited equation "X>25.4/(D*tan(1'))" . The claims however also do not teach the meaning of "tan(1')", it can only be examined in the broadest interpretation. It is known in the art that general eyesight is 1.0, which means the minimum angular separation, is 1/60 degree or one minute. This means the **definition** is **1/*L* > 25.4/(D'* tan (1'))(dpi).**

Claim 1 and 14 has been amended to include the phrase that "*a definition of the three-dimensional image in the horizontal direction is less than the resolution by the eyesight of a viewer whose midpoint between the right eye and the left eye is positioned in the three-dimensional visible rang".* This phrase is objected for the reason stated above. However this feature is implicitly met since the three-dimensional image is observed by the observer when the observer placing his eyes within the three-dimensional visible range.

With regard to claim 3, Ichinose et al teaches that the display device having this display panel could be a liquid crystal display device, (please see column 2, line 5 or column 5, lines 38-40).

With regard to claim 11,, Ichinose et al teaches the image display device is intended for displaying three-dimensional images taken from photographs and being processed by a computer, (please see 3). However it does not specify that it is movie picture. But the application of such display apparatus

to display movie pictures would have been obvious to one skilled in the art since it involves only feed in movie pictures to the computer for processing, and such modification has the advantage of displaying three dimensional movie pictures.

With regard to claims 12-13, this reference also does not teach explicitly that the display apparatus is applied to different portable devices. However since Ichinose et al does teach that the display device includes liquid crystal display and it is known in the art that liquid crystal display device is widely applied in many portable visual devices, such modifications would have been obvious to one skilled in the art to allow this stereoscopic image display device be applied in different *portable* device for providing portable 3D views. It also has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. Ex parte Madham, 2 USPQ2d 1647 (1987).

9. **Claims 2, 4, and 15 and newly added claims 26 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ichinose et al as applied to claims 1 and 14 above, and further in view of the patent issued to Isono et al (PN. 5,315,377).**

The method and apparatus for outputting image for stereoscopic vision taught by **Ichinose et al** as described for claims 1, and 14 above has met all the limitations of the claims. With regard to claims 2 and 15, this reference does not teach explicitly about the definition of the pixel section in vertical direction of the pixels matrix. With regard to claim 4, this reference also does not teach explicitly that the optical unit can be parallax barriers with a plurality of slits. **Isono** et al in the same field of endeavor teach a three-dimensional image display wherein a *parallax barrier* having a plurality of slits (Figures 2, 4 and 8A), that is aligned with the matrix arrangement of the pixels (Figures 8B and 9) is used to provide the three-dimensional image display. It is implicitly true for square or rectangular type of pixel section, the **same definition analysis disclosed above** also applies for the **vertical** direction of the matrix to allow

the image being resolved by the eyes of the observer to achieve stereoscopic viewing. It would then have been obvious to one skilled in the art to apply the teachings of Isono et al to modify the display apparatus of **Ichinose** et al to use parallax barrier, an electronic one as disclosed by Isono et al, as alternative means to achieve the stereoscopic image display for the benefit of allowing different design and control, (the electronic driven parallax barrier has the advantage of controlling the slit size), that suited for different application to achieve the stereoscopic image viewing.

10. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ichinose et al as applied to claim 1 above, and further in view of the patent issued to Chikazawa (PN. 5,852,512).

The method and apparatus for outputting image for stereoscopic vision taught by **Ichinose et al** as described for claim 1, above have met all the limitations of the claims. Ichinose et al teaches the optical unit is a *lenticular* lens having a plurality of cylindrical lenses. However it does not teach explicitly that the cylindrical lenses are arranged periodically in the horizontal direction and extended in the vertical direction. But it is true that the lenticular lenses of Ichinose et al are arranged periodically in the horizontal direction. And it is implicitly true that the lenticular lens is extended in a perpendicular direction with respect to the periodical direction as explicitly demonstrated by the teachings of **Chikazawa**. **Chikazawa** in the same field of endeavor teaches a lenticular lens having a plurality of cylindrical lenses that are arranged along the horizontal direction of the pixels and extended in the vertical direction. It would have been obvious to one skilled in the art to make the lenticular lens has this geometric arrangement for the benefit of providing horizontal parallax to allow stereoscopic vision.

11. Claims 1, 3, 11-14, 16, and newly added claims 25 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Momochi (PN. 5,528,420) in view the patent issued to Ichinose et al (PN. 4,987,487).

Momochi teaches a *method* and *apparatus* for outputting image for stereoscopic vision wherein the apparatus comprises a display panel having a *plurality of pixels* forming pixel sections wherein the plurality of pixels displaying image for the right eye and image for the left eye respectively, and the pixels has a *matrix* form, (please see Figures 4 and 5) and are arranged periodically in horizontal direction. The apparatus further comprises an *optical unit*, such as a *lenticular lens*, for re-emitting image light from the display panel to *right eye and left eye of an observer*, respectively, (please see Figures 6-8). It is implicitly true that a three-dimensional or stereoscopic visible region is inherently defined by placing the midpoint between a viewer's right and left eyes in the visible range such that the image light emitted from the pixels for displaying the right image will incident to the right eye of the observer and the image light emitted from the pixels for display the left image will incident to the left eye of the observer. And it is implicitly true that there is a definite distance (D'), in the *normal direction* with respect to the display panel, between the *most* distant point in the three-dimensional visible range and the display panel and there is a definite distance (D"), in the normal direction with respect to the display panel, between the *midpoint* of the two eyes of the observer and the display panel.

As demonstrated by the Figure 7, the distance D", measured from the midpoint of the two eyes to the display panel, should equal to D (observation distance) *plus* (n*f). The symbol "n" means refractive index of the lenticular lens and "f" means the focal length of the lens. The *smallest* separation between two adjacent image pixel sections that can be *resolved* by the eyes so that one image from the first pixel section to be directed to left eye and the other image from the adjacent second pixel section to the right eye is indicated in Figure 7 as Δ. And the definition of the pixel section is defined as $1/\Delta$. From simple geometry one can calculate the definition of the pixel section as the following:

Assuming the *angular separation* between the image lights from the two adjacent pixel sections is *a* and the angular separation of the image light after passing through the optical unit or lenticular lens is *b*. Then the following condition can be established:

$\Delta/n*f = \tan(a)$ and $W/D = \tan(b)$. W being the separation distance between two eyes and D is the observation distance.

The actual distance between the midpoint of the two eyes and the display panel (D") and the actual distance between the most distant point in the three dimensional visible range and the display panel (D') are defined as follows:

D"= D + n*f and D'> D".

One can then get the following conditions:

$\Delta + W = (n*f)\tan(a) + D\tan(b)$, for paraxial light, $b = n*a$, and $\tan(a)$ approximately equals to a in radians and $\tan(b)$ approximately equals to b in radians. And if the optical unit is a *parallax barrier* with slits instead of the lenticular lens, the angle a will be equal to angle b. This means the following:

$\Delta + W$ approximately equals $(n*f + D)*\tan(a)$, which then equals to D"* tan (a). This means

$\Delta < D" *\tan(a)$, or $1/\Delta > 1/(D"*\tan(a))$, with the conversion factor between millimeter to inch (i.e. 25.4 millimeter per inch), **$1/\Delta > 25.4/(D"*\tan(a))$ (dpi).** Similarly $\Delta < D'*\tan(a)$, (i.e. distance measured from display panel to the most distant point in the visible range), and **$1/\Delta > 25.4/(D'*\tan(a))$ (dpi).**

This means **$1/\Delta > 25.4/(DIS*\tan(a))$ (dpi).** By setting the distance in the normal direction of the observer to the display panel to be **DIS, wherein DIS is between D' and D" or be at the most distant point D'.** The **definition** of the pixel section ($1/\Delta$) therefore is defined with respect to the angular separation of the image light from the adjacent pixel section. This reference however does not teach explicitly that the equation for definition is of the form recited in the claims. But the specification and claims also fail to give support and meaning for the claimed equation such feature can only be examined in the broadest interpretation. It is known in the art that a general eyesight is 1.0, which means the minimum angular separation, is 1/60 degree or one minute. This means the **definition** is **$1/\Delta > 25.4/(D"*\tan(1'))$ (dpi), where the angle "a" is 1 minute.**

Claim 1 and 14 has been amended to include the phrase that "*a definition of the three-dimensional image in the horizontal direction is less than the resolution by the eyesight of a viewer whose midpoint between the right eye and the left eye is positioned in the three-dimensional visible rang".* This phrase is objected for the reason stated above. However this feature is implicitly met since the three-dimensional image is observed by the observer when the observer placing his eyes within the three-dimensional visible range.

This reference has met all the limitations of the claims with the exception that it does not teach explicitly that the pixels of the display device emits the image light. It is known in the art that the geometric relationship between the definition in term of the viewing distance of the observer does not change by whether the fact that the image pixels actually emit the light themselves or the image light reflected from them since the definition is defined by the geometric relationship set forth in above, (the applicant is noted no where in the mathematical deduction above does the fact of the origin of the image light come in to become a determining factor). Furthermore, it is well known in the art to use display device such as liquid crystal display device to provide the display panel having plurality of pixels sections and optical unit that emits the image light emitted from the liquid crystal display device to provide the stereoscopic image display as demonstrated by **Ichinose** et al. **Ichinose** et al teaches explicitly about same geometric relationship between the image definition and the observation viewing distance, (please see Figures 8-9). It would then have been obvious to one skilled in the art to apply the teachings of Ichinose et al to use liquid crystal display device as the display panel for the benefit of allowing the stereoscopic image display arrangement of Momochi be applied to a variety of display device utilizing liquid crystal display device such as television, video game device or computer. With regard to claim 3, Ichinose et al teaches explicitly that the display device having this display panel could be a liquid crystal display device, (please see column 2, line 5 or column 5, lines 38-40).

With regard to claim 11,, Momochi teaches the image display device is intended for displaying three-dimensional images taken from photographs and being processed by a computer, (please see 3). However it does not specify that it is movie picture. But the application of such display apparatus to display movie pictures would have been obvious to one skilled in the art since it involves only feed in movie pictures to the computer for processing, and such modification has the advantage of displaying three dimensional movie pictures.

With regard to claims 12-13, this reference also does not teach explicitly that the display apparatus is applied to different portable devices. However it has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. Ex parte Madham, 2 USPQ2d 1647 (1987).

12. **Claims 2, 4, 7, 15, and newly added claims 26 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Momochi and Ichinose et al as applied to claims 1 and 14 above, and further in view of the patent issued to Isono et al (PN. 5,315,377).**

The method and apparatus for outputting image for stereoscopic vision taught by **Momochi in view of the teachings of Ichinose et al** as described for claims 1 and 14, above have met all the limitations of the claims. With regard to claims 2 and 15, this reference does not teach explicitly about the definition of the pixel section in a second direction of the pixels matrix. With regard to claim 4, this reference also does not teach explicitly that the optical unit can be a parallax barriers with a plurality of slits. **Isono** et al in the same field of endeavor teach a three-dimensional image display wherein a *parallax barrier* having a plurality of slits (Figures 2, 4 and 8A), that is aligned with the matrix arrangement of the pixels (Figures 8B and 9) is used to provide the three-dimensional image display. It is implicitly true for square or rectangular type of pixel section, ***the same definition analysis*** disclosed

above also applies for the vertical direction of the matrix to allow the image being resolved by the eyes of the observer to achieve stereoscopic viewing. It would then have been obvious to one skilled in the art to apply the teachings of Isono et al to modify the display apparatus of Momochi to use parallax barrier, an electronic one as disclosed by Isono et al, as alternative means to achieve the stereoscopic image display for the benefit of allowing different design and control, (the electronic driven parallax barrier has the advantage of controlling the slit size), that suited for different application to achieve the stereoscopic image viewing.

13. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Momochi and Ichinose et al as applied to claim 1 above, and further in view of the patent issued to Chikazawa (PN. 5,852,512).

The method and apparatus for outputting image for stereoscopic vision taught by **Momochi in view of the teachings of Ichinose et al** as described for claim 1 above have met all the limitations of the claims. Momochi teaches the optical unit is a *lenticular* lens having a plurality of cylindrical lenses. However it does not teach explicitly that the cylindrical lenses are arranged periodically in the horizontal direction and extended in the vertical direction. But it is true that the lenticular lens of Momochi are arranged periodically in the horizontal direction. And it is implicitly true that the lenticular lens is extended in a perpendicular direction with respect to the periodical direction as explicitly demonstrated by the teachings of **Chikazawa**. **Chikazawa** in the same field of endeavor teaches a lenticular lens having a plurality of cylindrical lenses that are arranged along the horizontal direction of the pixels and extended in the vertical direction. It would have been obvious to one skilled in the art to make the lenticular lens has this geometric arrangement for the benefit of providing horizontal parallax to allow stereoscopic vision.

Response to Arguments

14. Applicant's arguments filed on June 7, 2007 have been fully considered but they are not persuasive. The newly amended and newly added claims have been fully considered and are rejected for the reasons stated above.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Audrey Y. Chang whose telephone number is 571-272-2309. The examiner can normally be reached on Monday-Friday (8:00-4:30), alternative Mondays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephone B. Allen can be reached on 571-272-2434. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Audrey Y. Chang, Ph.D.
Primary Examiner
Art Unit 2872

A.Chang, Ph.D.